



Microcontrollers: intro



Outline

- Introduction to microcontrollers
- simulation of an MCU using Multisim

Microcontroller units (MCUs)

- From very small (3 mm!)
- to rather sophisticated...

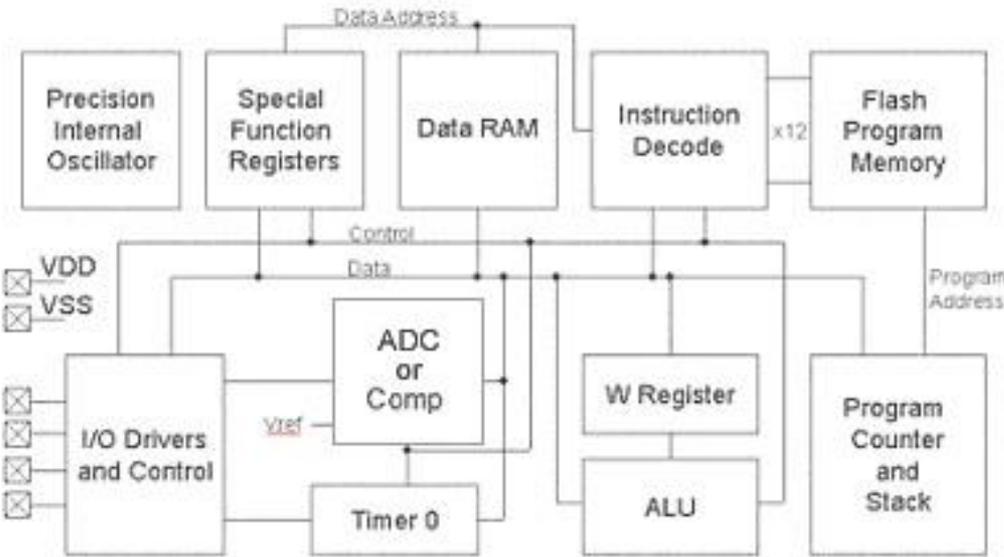
Dual 10-Channel 24-Bit MicroConverter[®]
...with 1-cycle flash 8052

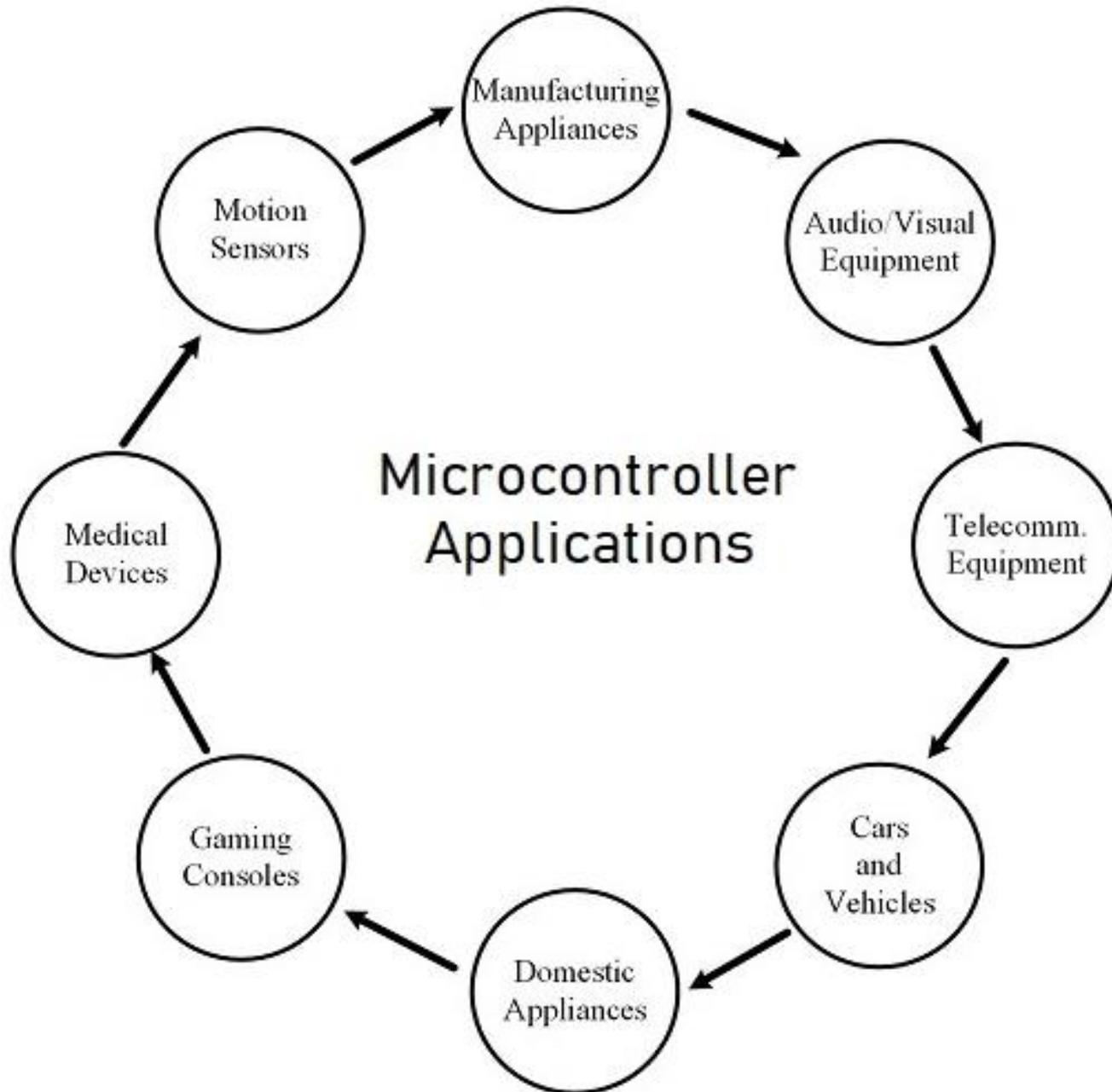
ANALOG DEVICES ADuC845

8mm

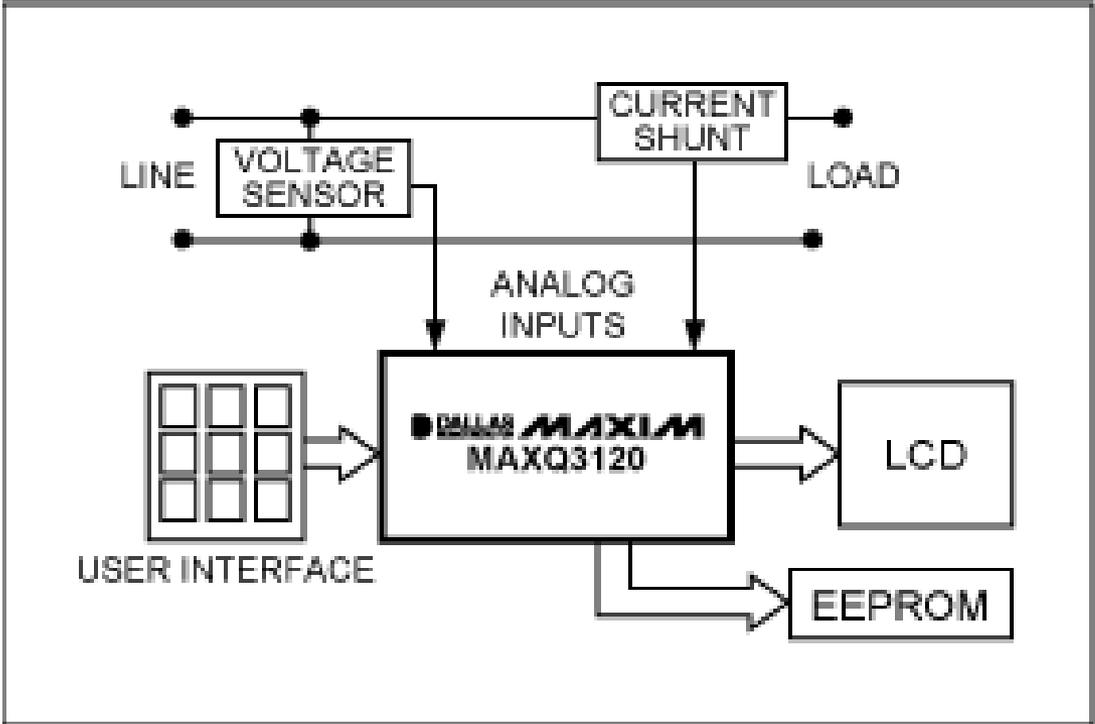
- 21-bit effective resolution @ 50 Hz
- 15 ppm max INL
- 24-bit monotonic
- low offset ± 0.6 ppm
- offset drift: ± 0.002 ppm/ $^{\circ}$ C
- 62 kbyte flash memory

Flash MCU





MCU example: electricity monitoring



MCU example: electric motor control

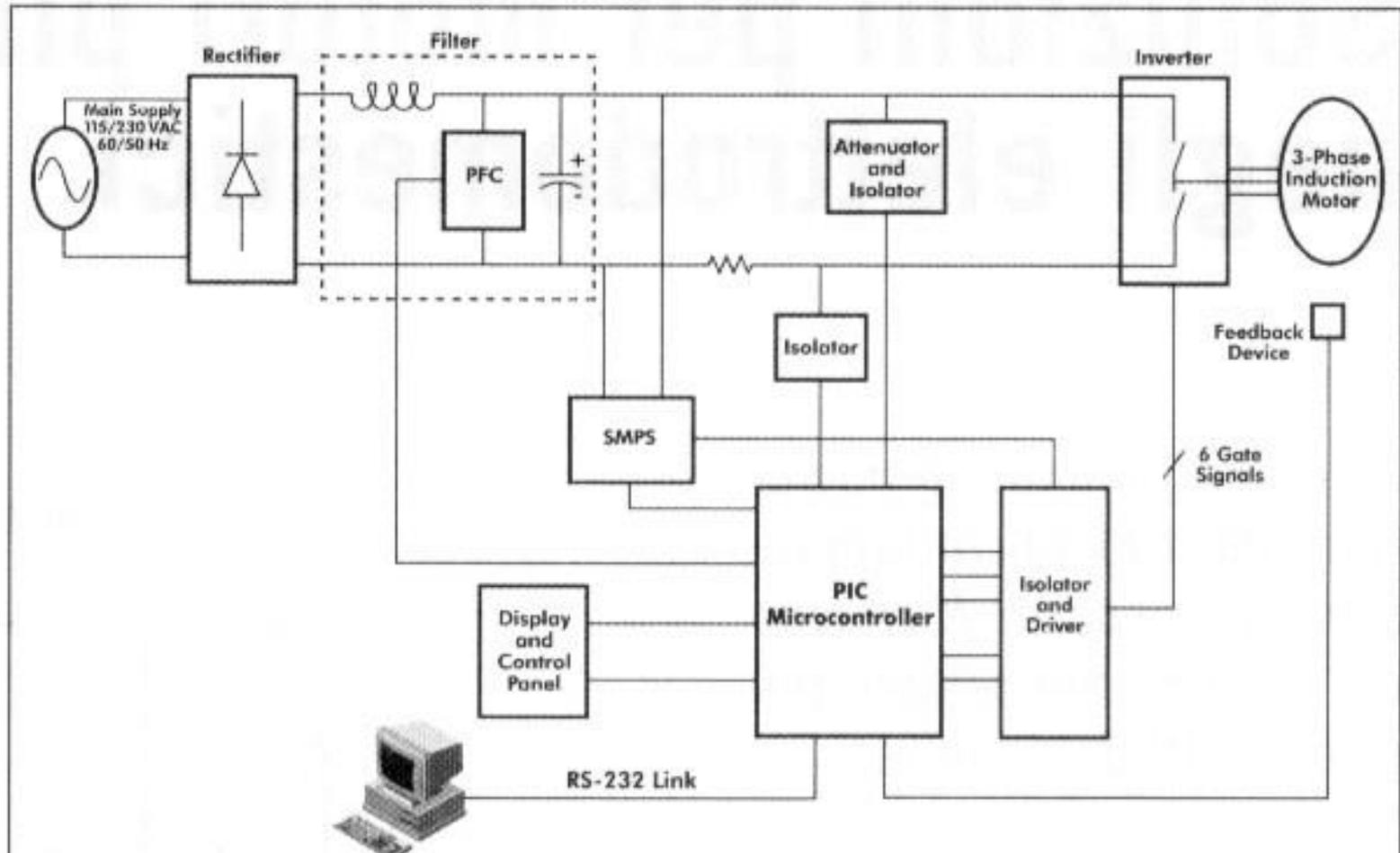
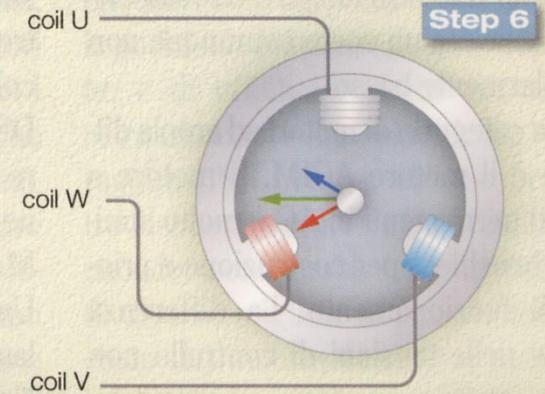
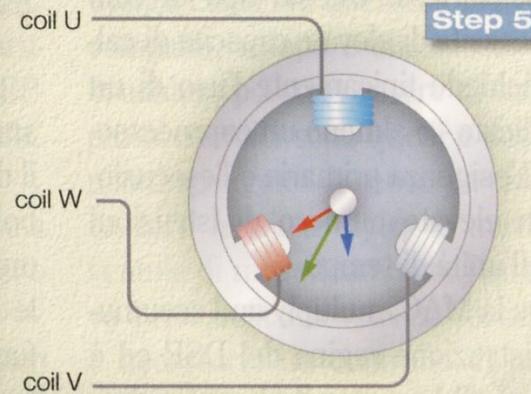
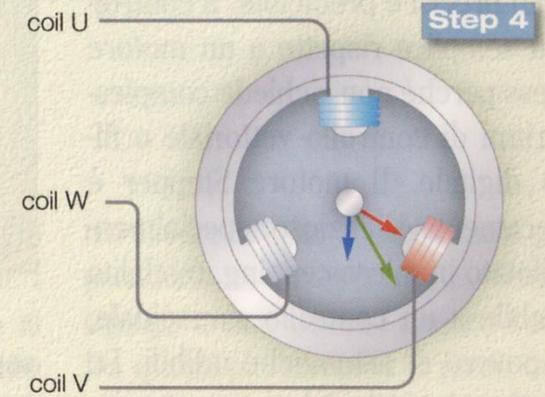
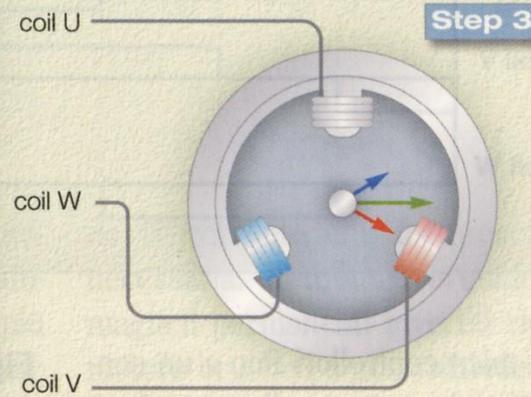
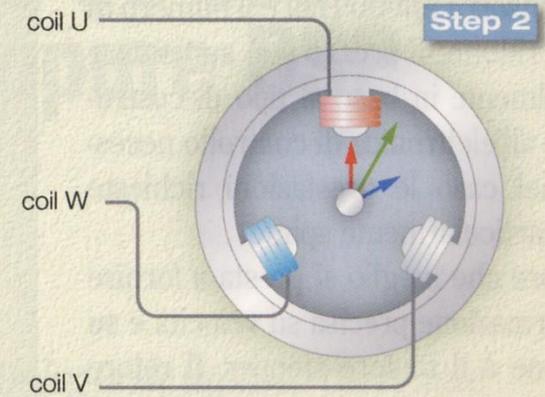
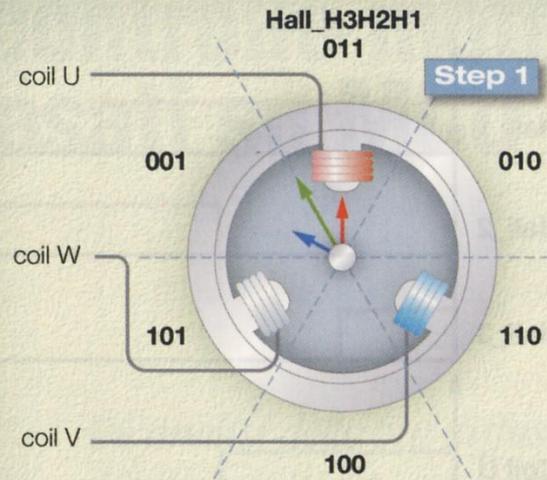


Figura 2

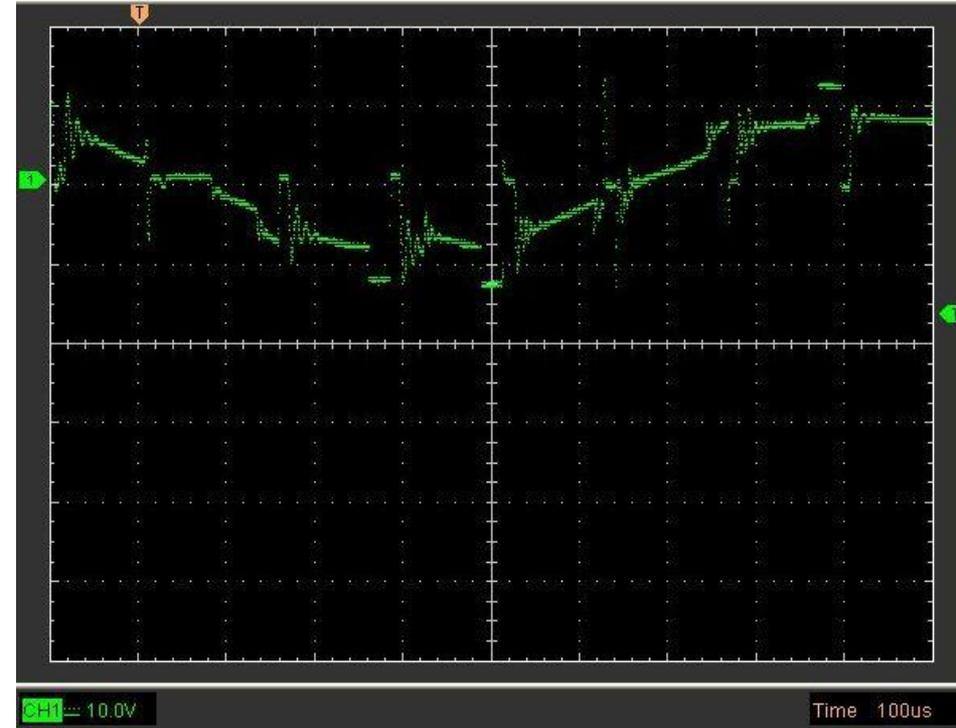
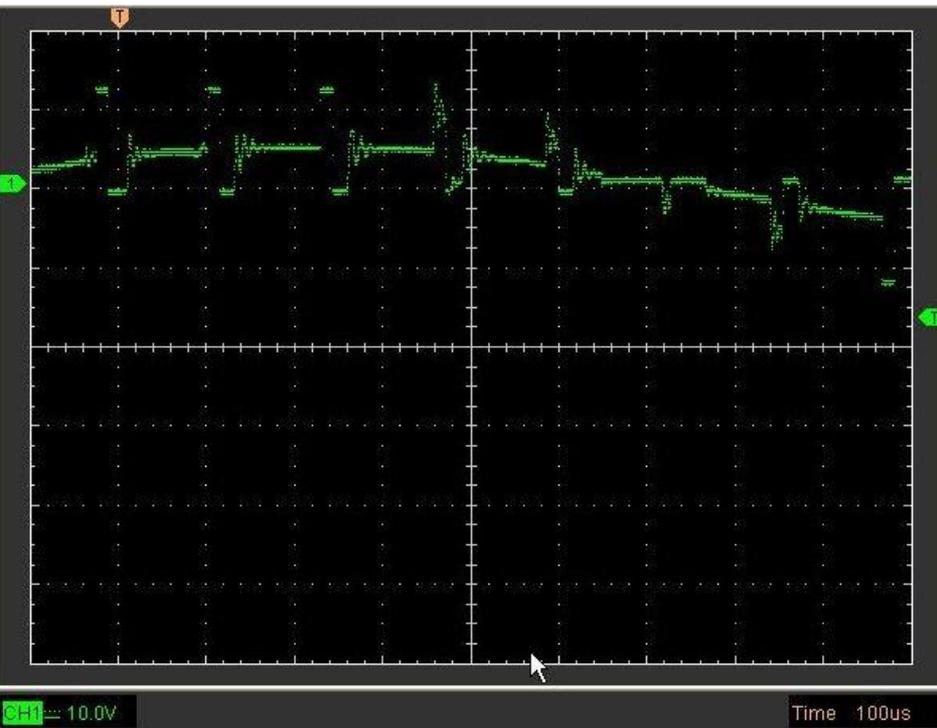
Pilotaggio a frequenza variabile di un ACIM trifase usando MCU PIC18Fxx31

MCU example: electric motor control

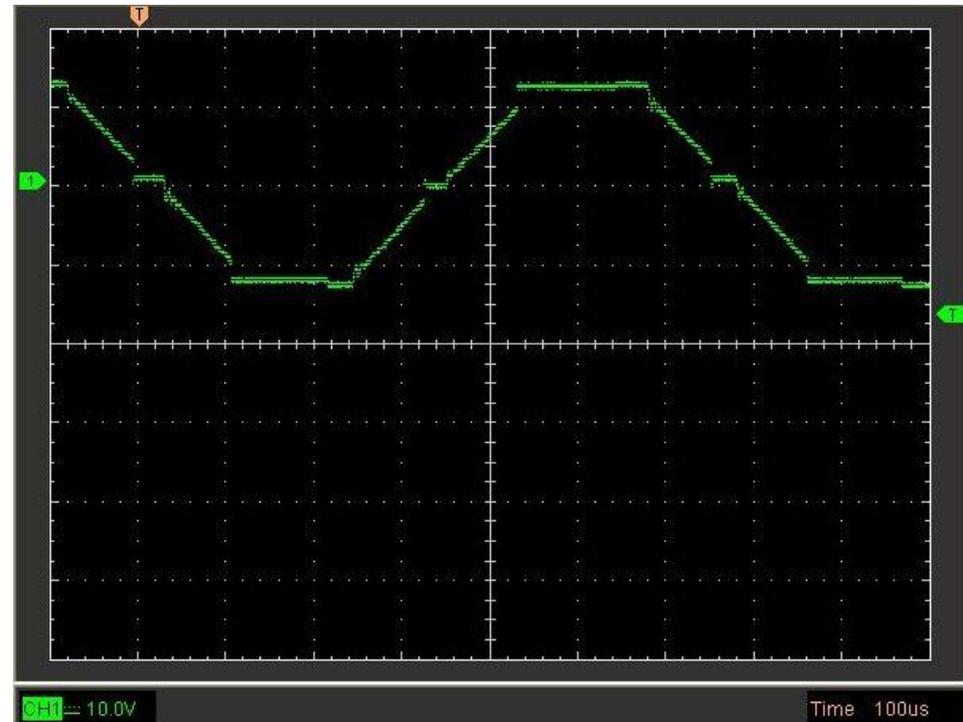
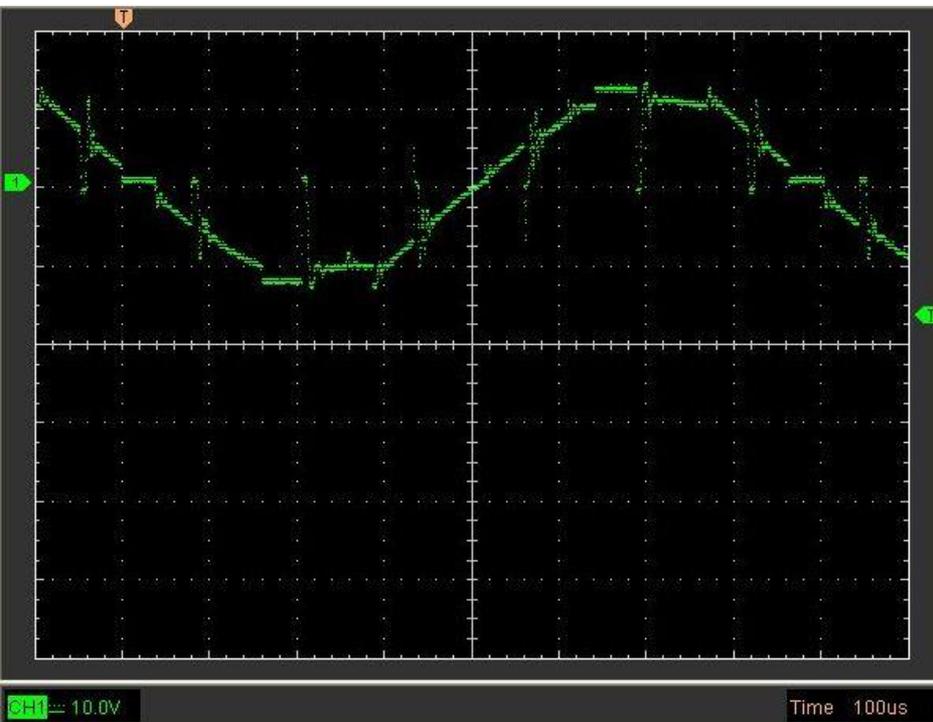
- DC brushless motor actuation (possibly with sensorless control)



DC brushless motor actuation with sensorless control



DC brushless motor actuation with sensorless control



MCU: air conditioning

